

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,954,214 B2  
APPLICATION NO. : 09/780325  
DATED : October 11, 2005  
INVENTOR(S) : Wilt et al.

Page 1 of 4

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the title page, item (56), in "Other Publications", in column 2, line 12,  
after "229-299" insert -- (1997) --.

In the drawings:

On Sheet 4 of 9, in FIG. 4, please replace "FIG. 4" with the following figure.

**FIG. 4**

```
310 —
extern "C" void
LinearToRGBColor( Color *pOut, Color *pIn )
{
    // finer approximation that avoids taking 3 successive
    // square roots: apply one round of N-R to guess cube
    // root of x*sqrt(sqrt(x))
    for ( int i = 0; i < 4; i++)
    {
        float x = (*pIn)[i];

        float sqrtx = sqrtf(x);
        float sqrt2x = sqrtf(sqrtx);
        float appx = 0.78f*sqrtx+0.22f*sqrt2x;
        float num = x*sqrt2x;
        float cuberoot = (2*appx+(x*sqrt2x)/(appx*appx))/3.0f - 0.00025f;
        if ( x < 0.00304f )
            x = 12.92f * x;
        else
            x = 1.055f*cuberoot-0.055f;
        (*pOut)[i] = x;
    }
}
```

Signed and Sealed this  
Eighth Day of May, 2012

*David J. Kappos*

David J. Kappos  
Director of the United States Patent and Trademark Office

U.S. Pat. No. 6,954,214 B2

In the drawings:

On Sheet 5 of 9, in FIG. 5, please replace "FIG. 5" with the following figure.

**FIG. 5**

400

```

const __declspec(align(16)) __m128 Const039 = _mm_set1_ps(
0.03928f );
const __declspec(align(16)) __m128 ConstInv1292 = _mm_set1_ps(
1.0f/12.92f );
const __declspec(align(16)) __m128 Const1055 = _mm_set1_ps( 0.055f
);
const __declspec(align(16)) __m128 ConstInv1055 = _mm_set1_ps(
1.0f/1.055f );

const __declspec(align(16)) __m128 Const1285 = _mm_set1_ps(
1.285f );
const __declspec(align(16)) __m128 Const0285 = _mm_set1_ps(
0.285f );

```

In the drawings:

On Sheet 6 of 9, in FIG. 6, please replace "FIG. 6" with the following figure.

**FIG. 6**

401

```

extern "C" void
sRGBColor( Color *pOut, Color *pIn )
{
    // SIMD: compute BOTH answers and compose output using mask
    __m128 ansBelowDelta = _mm_mul_ps( (__m128) pIn, ConstInv1292 );
    __m128 x = _mm_mul_ps( ConstInv1055, _mm_add_ps( (__m128) pIn,
Const055 ) );
    __m128 sqrx = _mm_mul_ps( x, x );
    __m128 invsqrx = _mm_rcp_ps( sqrx );
    __m128 invsqrtx = _mm_rsqrt_ps( x );
    __m128 ansAboveDelta = _mm_div_ps( Const1285,
    _mm_mul_ps( invsqr, _mm_add_ps( Const0285, invsqrtx ) ) );
    __m128 TrueifLTDelta = _mm_cmplt_ps( (__m128) pIn, Const039 );
    (__m128) pOut = _mm_or_ps( _mm_and_ps( TrueifLTDelta, ansBelowDelta
),
    _mm_andnot_ps( TrueifLTDelta, ansAboveDelta ) );
}

```

U.S. Pat. No. 6,954,214 B2

In the drawings:

On Sheet 7 of 9, in FIG. 7, please replace "FIG. 7" with the following figure.

500

FIG. 7

```

const __declspec(align(16)) __m128 CONST00304 = _mm_set1_ps( 0.00304f );
const __declspec(align(16)) __m128 CONST1292 = _mm_set1_ps( 12.92f );
const __declspec(align(16)) __m128 CONST055 = _mm_set1_ps( 0.055f );
const __declspec(align(16)) __m128 CONST1055 = _mm_set1_ps( 1.055f );

const __declspec(align(16)) __m128 CONST078 = _mm_set1_ps( 0.78f );
const __declspec(align(16)) __m128 CONST1m078 = _mm_set1_ps( 1.0f-0.78f );

const __declspec(align(16)) __m128 CONST38 = _mm_set1_ps( 0.38f );
const __declspec(align(16)) __m128 CONST1m38 = _mm_set1_ps( 1.0f-0.38f );

extern "C" void
LinearToRGBColor( Color *pOut, Color *pin )
{
    __m128 ansBelowDelta = _mm_mul_ps( (__m128 *) pin, CONST1292 );
    __m128 sqrtx = _mm_sqrt_ps( (__m128 *) pin );
    __m128 sqrt3x = _mm_sqrt_ps( _mm_sqrt_ps( sqrtx ) );
    __m128 pow124 = _mm_add_ps( _mm_mul_ps( CONST38, sqrtx ),
                                _mm_div_ps( _mm_mul_ps( CONST1m38, sqrtx ), sqrt3x ) );
    __m128 ansAboveDelta = _mm_sub_ps( _mm_mul_ps( CONST1055, pow124 ), CONST055 );
    __m128 TrueIfLTDelta = _mm_cmplt_ps( (__m128 *) pin, CONST00304 );
    (__m128 *) pOut = _mm_or_ps( _mm_and_ps( TrueIfLTDelta, ansBelowDelta ),
                                _mm_andnot_ps( TrueIfLTDelta, ansAboveDelta ) );
}

```

U.S. Pat. No. 6,954,214 B2

In the drawings:

On Sheet 8 of 9, in FIG. 8, please replace “FIG. 8” with the following figure.

500

**FIG. 8**

```

const __declspec(align(16)) __m128 Magic00304 = _mm_set1_ps( 0.00304f );
const __declspec(align(16)) __m128 Magic1292 = _mm_set1_ps( 12.92f );
const __declspec(align(16)) __m128 Magic055 = _mm_set1_ps( 0.055f );
const __declspec(align(16)) __m128 Magic1055 = _mm_set1_ps( 1.055f );
const __declspec(align(16)) __m128 MagicInv3 = _mm_set1_ps( 1.03307f );
const __declspec(align(16)) __m128 MagicFudge = _mm_set1_ps( 0.00025f );

const __declspec(align(16)) __m128 Magic078 = _mm_set1_ps( 0.78f );
const __declspec(align(16)) __m128 Magic1m078 = _mm_set1_ps( 1.0f-0.78f );

const __declspec(align(16)) __m128 Magic38 = _mm_set1_ps( 0.38f );
const __declspec(align(16)) __m128 Magic1m38 = _mm_set1_ps( 1.0f-0.38f );

extern "C" void
LinearToRGBColor( Color *pOut, Color *pin )
{
    __m128 ansBelowDelta = _mm_mul_ps( (__m128 *) pin, Magic1292 );
    __m128 sqrtx = _mm_sqrt_ps( (__m128 *) pin );
    __m128 sqrt2x = _mm_sqrt_ps( sqrtx );
    __m128 appx = _mm_add_ps( _mm_mul_ps( Magic078, sqrtx ),
        _mm_mul_ps( Magic1m078, sqrt2x ) );
    __m128 cuberoot = _mm_sub_ps(
        _mm_mul_ps( MagicInv3,
            _mm_add_ps( _mm_add_ps( appx, appx ),
                _mm_div_ps( _mm_mul_ps( (__m128 *) pin, sqrt2x ),
                    _mm_mul_ps( appx, appx ) ) ) )
        ), MagicFudge );
    __m128 ansAboveDelta = _mm_sub_ps( _mm_mul_ps( Magic1055, cuberoot ), Magic055 );
    __m128 TrueHrTDelta = _mm_cmplt_ps( (__m128 *) pin, Magic00304 );
    (__m128 *) pOut = _mm_or_ps( _mm_and_ps( TrueHrTDelta, ansBelowDelta ),
        _mm_andnot_ps( TrueHrTDelta, ansAboveDelta ) );
}

```

In column 3, line 5, delete “modern” and insert -- modern --, therefor.

In column 3, line 32, delete “ $x^{1/24}$ ” and insert --  $x^{1/2.4}$  --, therefor.

In column 6, line 63, delete “ $x^{1/2.4} = \sqrt[3]{x^{1.25}}$ ” and insert --  $x^{1/2.4} = \sqrt[3]{x^{1.25}}$  --, therefor.

In column 6, line 64, after “which” insert -- can be --.

In column 8, line 1, delete “ $x^{0.5}$ ” and insert --  $x^{0.5}$  --, therefor.

In column 8, line 40, delete “un-altered” and insert -- unaltered --, therefor.

In column 12, line 6, in Claim 8, after “having” delete “in” and insert -- an --, therefor.